PUBLICATION 1581

MORELS

A Gourmet's Delight

630.4
C212
P 1581
1976
(1983 print)
c.3

Agriculture Canada

SHOUT
SHARE
IT

PUBLICATION 1581, available from Communications Branch, Agriculture Canada, Ottawa K1A 0C7.

©Minister of Supply and Services Canada 1976
Cat. No. A73-1581/1976 ISBN: 0-662-00321-7
Printed 1976 Reprinted 1983 4M-9:83

Aussi disponible en français.

Cover Photo:

A collection of *Morchella esculenta* and *M. elata.*

Digitized by the Internet Archive
in 2012 with funding from
Agriculture and Agri-Food Canada – Agriculture et Agroalimentaire Canada

http://www.archive.org/details/morelsgourmetsde00mall

MORELS — *A Gourmet's Delight*

D. MALLOCH

Biosystematics Research Institute[1]
Ottawa, Ontario

Among our many edible fungi, none can top the morel for flavor and versatility. Morels have been sought in Europe and Asia for centuries and have tempted the palates of both aristocrat and peasant. They are not as frequently sought in Canada, although they are abundant when in season.

The morel fruiting season occurs in late spring, a pleasant time to be outside. Morel hunting combines excitement of the chase with the tranquility of a stroll in the woods. To a morel hunter on a quiet walk, little can match the excitement of finding a hundred or more morels at his feet. This delight is only outdone by the delicious meal that follows.

WHAT ARE MOREL?

Morels are reproductive structures produced by an extensive underground mass of fungus threads called a mycelium. The mycelium lives in soil or in buried wood and ingests nutrients as it grows. When temperature, season, nutrients, moisture, and other factors are favorable, the mycelium produces fruiting structures called morels.

A morel looks like a sponge on a stick. The pits of the spongelike cap are lined with microscopic cylinders called asci, about 0.3 mm long. Each ascus contains eight microscopic football-shaped bodies called spores, which are about 0.02 mm long (Fig. 1). The spores germinate to produce new plants. Asci shoot their spores into the air away from the morel by building up enough water pressure inside to force open a small, hinged lid called the operculum at the top of the ascus. If a morel has been left undisturbed for an hour or two, the asci lining the

[1]Present address: Department of Botany, University of Toronto, Toronto, Ont.

surface of the pits can be exploded by blowing on the cap. A second or so later, the asci discharge almost simultaneously and produce a visible cloud of microscopic spores. If you blow on a morel and then hold it to your ear, you can hear the asci discharging. The sound is something like that of effervescent soda pop. A morel left on a piece of white paper to dry discharges a thick, yellow mass of spores called a spore print.

The stalk or stipe of the morel is usually paler than the spongy cap. It is often covered with fine scales and is not lined with asci.

Morels are hollow and do not contain the quantities of edible flesh that mushrooms do.

KINDS OF MORELS

Specialists disagree on the number of kinds or species of morels that have been found. Some authorities have recorded as many as 32 species. However, recent studies suggest that many of these so-called species are various stages of growth of one or two species. In this publication all Canadian morels are treated as representatives of two species: *Morchella elata* and *M. esculenta*.

Morchella elata (Fig. 2) is usually dark brown or nearly black and has a cylindrical or conical head. The ribs between the pits of the head are smoky black and usually continue from top to bottom as straight lines. A slight circular channel usually segregates the base of the head from the stalk. When immature, *M. elata* has a narrow cylindrical cap that gradually becomes conical as it matures. The stalk grows longer and broader during maturation. The earliest stage of *M. elata*, when the cap is very narrow and cylindrical, has been called *M. angusticeps*. As this morel matures, the head expands until it reaches the stage designated by some authors as *M. intermedia*. At maturity, when the head has fully expanded and thickened, the fungus has been called *M. conica*. These changes can be observed in morels left to grow in a natural habitat for 1 or 2 weeks.

Morchella esculenta (Fig. 3) is usually paler than *M. elata*. In this species the ribs are pale brown or whitish and do not form continuous lines from top to bottom. Instead they form an irregular network. There is no sterile channel separating the head from the stalk. Immature *M. esculenta* has a small, grayish, conical head and a thin stalk, which gradually enlarges with maturity. Early stages have been called *M. deliciosa*. At maturity, the head is irregular in shape and pale yellow-brown, and

the stalk is thickened at the bottom. This stage is often called *M. crassipes*. Variations in shape and color during its development have led many specialists to believe that they were finding new species, and they have reported them under names

Fig. 1. Asci and spores of *Morchella esculenta*
Fig. 2. *Morchella elata*.
Fig. 3. *Morchella esculenta*.
Fig. 4. *Helvella esculenta*.
Fig. 5. *Verpa bohemica*.
Fig. 6. *Mitrophora semilibera*.

such as *M. rotunda*, *M. vulgaris*, and *M. spongiola*. However, many of these "species" have often been collected in a single colony, which confirms that they all belong to the same species.

CAN OTHER FUNGI BE MISTAKEN FOR MORELS?

No other fungus looks like a morel. Once you have seen one, you can make no mistakes. However, a beginner might mistake a few related forms for morels.

The most dangerous of the morel-like fungi is *Helvella esculenta*, the beefsteak morel (Fig. 4). This fungus has a convoluted or brainlike head on a light-colored stalk. It is never ribbed and spongy like a true morel. The beefsteak morel is eaten and enjoyed by many people, but it can be poisonous if improperly cooked. The toxin in this fungus is removed by parboiling the fruiting bodies in an uncovered pot. However, if they are not boiled long enough, they remain dangerous to eat. Although some people seem to be able to tolerate the toxin, others cannot. Therefore, this fungus is not recommended for eating.

Helvella gigas looks like the beefsteak morel, but has a shorter, stouter stalk and a paler head. It is especially abundant in evergreen forests and is commonly collected for eating. Because its appearance is similar to the beefsteak morel, do not eat it if you are an inexperienced collector.

Three species, *Verpa bohemica* (Fig. 5), *V. conica*, and *Mitrophora semilibera* (Fig. 6), have pitted or convoluted heads, but they differ from morels in the way the head is attached to the stalk. In these fungi the stalk runs up inside the head and is attached either part way up or at the top; the lower part of the head hangs loose like a skirt. The head of a true morel is attached to the top of the stalk at its base and is never skirtlike. Although none of these three species are dangerous, some people seem to be sensitive to them and experience mild stomach upsets after eating them.

There are several species of *Helvella*, or false morels, that fruit in the summer and fall. These have smooth or convoluted, but not ribbed, heads and smooth or pitted stalks. Some are poisonous and should be avoided. If you find what looks like a morel in the summer or fall, do not eat it, because it is probably a false morel.

WHERE ARE MORELS FOUND?

Morels can be found throughout most of Canada, in-

cluding the Arctic. The following list of habitats may be useful in locating morels.

M. elata

- Under evergreens in northern or mountainous regions, often near melting snow.
- Under poplar, birch, or hazel in the northern and eastern forests.
- In areas burnt by forest fires.
- On exposed or nearly exposed limestone bedrock covered with deciduous trees, especially butternut, in the east.

M. esculenta

- Under elm trees recently killed by Dutch elm disease, on well-drained soils. This habitat is astoundingly productive in Ontario and Quebec.
- Under ash trees.
- In old apple orchards.
- In gardens or disturbed ground, frequently in grassy places.

Both species may occur in the same place year after year and it is well worth revisiting a productive spot the next year. For this reason, many morel hunters will not divulge the locations of their morel collecting grounds.

WHEN DO MORELS FRUIT?

Morels are spring fungi that fruit at different times across Canada. *M. elata* is earlier than *M. esculenta*. It is often found, especially in the mountains, near the retreating edges of melting snowbanks. This species has been found in the last week of May in La Vérendrye Provincial Park in Quebec, when traces of winter ice were still on the ground. In more northern localities this species has been found as late as July. In southern Ontario and Quebec, *M. elata* usually appears in the first 3 weeks of May. On the west coast of Canada it can be found as early as February, although records in the National Fungus Herbarium in Ottawa show that it is usually found around Vancouver and Victoria from early May to July.

M. esculenta appears a little later than *M. elata*. Around Ottawa collectors usually begin looking for it on Victoria Day weekend and for the 2 weeks that follow.

The following table briefly lists the fruiting periods in Canada for both species of morels. The dates were taken from

records in the National Fungus Herbarium and from the fungus collection at the University of Toronto. Although the fruiting periods listed appear to be extended, they are much shorter in any one locality. You will have to determine the effect of seasonal variations on the local morel crop in your own area. Altitude or a few degrees of latitude can have a profound effect on the growth and fruiting of fungi.

Region	Fruiting period	
	M. elata	*M. esculenta*
Lower Great Lakes, St. Lawrence Valley, Maritime Provinces, southern Manitoba	May 4 — June 1	May 4 — June 6
Northern coniferous forest	May 28 — July 8	No records
Western mountains	April 24 — July 5	June 2 (only one record; Arrowhead, B.C.)
Coast of British Columbia	April 18 — July 15 (rarely as early as February)	April 18 — June 3

HOW TO COLLECT MORELS

Morels easily attract all kinds of extraneous materials. They are so delicious that many insects and other small crawling things gather in them for a meal, and these in turn attract predators. Therefore, cut the morels open and wash them well before eating. The pitted caps also trap grains of sand, which are hard to remove and can ruin a good meal. Take along a basket and knife when you go collecting, and carefully cut off the sandy parts of the stalk before putting the morels in the basket. Do not keep morels in a plastic bag because it encourages bacterial decay to set in very quickly. Keep morels no longer than a few days in the refrigerator. The flavor is best on the day they are collected.

HOW TO PRESERVE MORELS

The fresh flavor of morels is impossible to preserve. However, a preserved morel is better than none at all, and it is worth while preserving the morels you cannot eat.

In parts of Europe people thread morels and mushrooms on long strings and hang them in the kitchen to dry. However, this method is often impractical in modern homes, and morels are best dried out of sight in the basement. Spread the morels

on screens placed on a collapsible clothes rack. Put one to three 200-watt light bulbs underneath the screens, and enclose the whole apparatus in a fireproof canvas apron. This device is capable of drying 4.5 kg (10 lb) of morels in 48 hr.

To freeze morels, partially cook them first. Morels can also be pickled or canned. Canned morels should be prepared in a pressure cooker to ensure sterility. Improperly sterilized preserves can cause food poisoning.

HOW TO COOK MORELS

Because of their spongy construction, morels can hold a large amount of liquid and they absorb any flavoring that is added to them. Few culinary experiences can match that of eating an expertly prepared morel, succulent with butter and its own exquisite juices.

The simplest way to cook morels is to slice the caps and stalks and sauté them in butter for 8-10 min. When they start to cook, they release the moisture contained within, until they are swimming in liquid. Some of this liquid evaporates during cooking, and the morels reabsorb the concentrated juice left behind. Serve them immediately before they release their liquid a second time and dry out. After you have tasted morels prepared this uncomplicated way, try adding condiments or wine to them while they are cooking. It is surprising how difficult it is to mask the characteristically delicate flavor of morels.

Their hollow interior is another feature of morels that endears them to the gourmet. Carefully slit the morels open on one side, and stuff them with various preparations. Reclose them, and bake.

The following books contain excellent recipes for cooking morels.

Coffin, G., and Lewis, M. 1965. Twenty common mushrooms and how to cook them. Internatl. Pocket Lib., Boston, Mass.

Krieger, L. C. 1967. The mushroom handbook. Dover Publ., N.Y. (Reprint of 1936 edition).

McIlvaine, C., and Macadam, R. K. 1973. One thousand American fungi. Dover Publ., N.Y. (Reprint of 1902 edition).

McKenny, M. 1971. The savory wild mushroom. Revised edition, D. E. Stuntz, ed. Univ. Washington Press, Seattle.

Miller, O. K. 1972. Mushrooms of North America. E. P. Dutton, N.Y.

Pomerleau, R. 1951. Mushrooms of Eastern Canada and the United States. Editions Chantecler, Montreal.

Sharp, C. W., ed. 1963. Kitchen magic with mushrooms. Mycol. Soc. San Francisco, Inc., P.O. Box 247, Berkeley, Calif.

A FINAL WORD OF CAUTION

A few scattered reports of people suffering mild stomach upsets from eating morels have been recorded in the literature. However these reports are scarce in comparison with the number of people eating morels. Most poisonings probably result when people eat some other mushroom that was accidentally included in the meal. One report from Ontario, though, seems to be a genuine case. A family had eaten several fruiting bodies of *M. elata* collected on the same day. The parents, who each had a drink prepared with rye whiskey several hours after the meal, suffered vomiting and diarrhea for about 4 hr. The children, who drank only soda pop, suffered no symptoms at all. Apparently the effects were caused by a combination of the morels and alcohol. A similar reaction occurs when alcohol is taken with the inky cap mushroom *Coprinus atramentarius*. Although this case was an isolated one and its effects were not serious, it illustrates that like many other foods, morels can cause adverse reactions in certain individuals.

Do not let these words of caution discourage you from trying morels. The slight risk of temporary discomfort has not prevented millions of eager morel fanciers from turning out each spring to gather this superb natural food.

CAL/BCA OTTAWA K1A 0C5
3 9073 00186569 2

CONVERSION FACTORS FOR METRIC SYSTEM

Imperial units	Approximate conversion factor	Results in:	
LINEAR			
inch	x 25	millimetre	(mm)
foot	x 30	centimetre	(cm)
yard	x 0.9	metre	(m)
mile	x 1.6	kilometre	(km)
AREA			
square inch	x 6.5	square centimetre	(cm^2)
square foot	x 0.09	square metre	(m^2)
acre	x 0.40	hectare	(ha)
VOLUME			
cubic inch	x 16	cubic centimetre	(cm^3)
cubic foot	x 28	cubic decimetre	(dm^3)
cubic yard	x 0.8	cubic metre	(m^3)
fluid ounce	x 28	millilitre	(ml)
pint	x 0.57	litre	(ℓ)
quart	x 1.1	litre	(ℓ)
gallon	x 4.5	litre	(ℓ)
bushel	x 0.36	hectolitre	(hl)
WEIGHT			
ounce	x 28	gram	(g)
pound	x 0.45	kilogram	(kg)
short ton (2000 lb)	x 0.9	tonne	(t)
TEMPERATURE			
degrees Fahrenheit	(°F-32) x 0.56 or (°F-32) x 5/9	degrees Celsius	(°C)
PRESSURE			
pounds per square inch	x 6.9	kilopascal	(kPa)
POWER			
horsepower	x 746	watt	(W)
	x 0.75	kilowatt	(kW)
SPEED			
feet per second	x 0.30	metres per second	(m/s)
miles per hour	x 1.6	kilometres per hour	(km/h)
AGRICULTURE			
gallons per acre	x 11.23	litres per hectare	(ℓ/ha)
quarts per acre	x 2.8	litres per hectare	(ℓ/ha)
pints per acre	x 1.4	litres per hectare	(ℓ/ha)
fluid ounces per acre	x 70	millilitres per hectare	(ml/ha)
tons per acre	x 2.24	tonnes per hectare	(t/ha)
pounds per acre	x 1.12	kilograms per hectare	(kg/ha)
ounces per acre	x 70	grams per hectare	(g/ha)
plants per acre	x 2.47	plants per hectare	(plants/ha)